



C-10's Radiological Monitoring Network

**Dave Lochbaum
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The C-10 Research & Education Foundation is a 501(c)(3) non-profit organization founded in 1991. C-10 stands for “citizens within the ten-mile radius” of the Seabrook* nuclear plant in New Hampshire.

Since 1992, C-10 has operated the Citizens Radiological Monitoring Network under contract with the Commonwealth of Massachusetts’ Department of Public Health (DPH) and the Massachusetts Emergency Management Agency (MEMA).

*** Seabrook has two Westinghouse four-loop pressurized water reactors similar to but about 10 percent higher power than Indian Point Units 2 and 3. Seabrook Unit 2 was never completed; Unit 1 began commercial operation in August 1990.**

The Citizens Radiological Monitoring Network consists of eleven monitoring stations in Massachusetts, six monitoring stations in New Hampshire (privately funded) and a control station in Massachusetts.

Safety for Citizens



Station #	Location
02	Plum Is., Newburyport, MA
05	Salisbury Beach, MA
07	Fern Ave., Amesbury, MA
08	Salisbury, MA
09	Newbury, MA
14	City Hall, Newburyport, MA
15	West Newbury, MA - Pentucket School
16	West Newbury, MA - Page School
18	Downtown Amesbury, MA
21	South End, Newburyport, MA
23	Seabrook Beach, NH
24	Hampton, NH
25	Hampton, NH
26	Byfield, MA
27	Brentwood, NH
28	Exeter, NH
29	Kensington, NH
91	Somerville, MA (control station)

Geiger Mueller detectors are used to monitor for beta (measured in counts per minute) and gamma (measured in milli-Roentgens) radiation.

The detectors are calibrated annually.

The detectors, wiring, and associated peripherals are inspected quarterly.

A mobile unit is used monthly to compare readings between it and each monitoring station.

The monitoring stations consist of a radiological probe detecting beta and gamma radiation, an anemometer measuring wind speed and direction, wires protected against ultraviolet light and salt air, and a device to transmit data to the central database.



Network Administrator Mike Mansir holds one of the radiological probes manufactured by International Medcom. The device measures beta and gamma radiation and communicates the data in near-real time to C-10's central database.

Each probe costs about \$3,500 with a 4-month lead time for acquisition (per Mike on 08/10/2022).



C-10's Chris Nord checks on a wind anemometer at one of our sites.



The R.M. Young anemometer at left is marine grade and measures wind speed and direction.

Each anemometer costs about \$1,500 (per Mike on 08/10/2022).



Micro-computer (called an EBox) that replaced laptops at the monitoring stations for relaying data to C-10's central database.

Each station (probe, anemometer, wires and microcomputer) costs about \$7,000 (per Mike 08/10/2022)

C-10 submits monthly reports with a brief narrative to the DPH and MEMA. At DPH's request, the reports are only sent to the State, but one can request the reports from the State online at

<https://www.mass.gov/forms/request-public-records-from-the-department-of-public-health>

Should a station detect beta or gamma levels more than three times background levels, notifications will be sent to the cell phones and email of predetermined C-10 staff and State employees.

An example of a notification:

***(C10 System Alert) C10 Remote Alert!
Station 1: Beta: 130 Gamma 0.042***

C-10's protocols feature three priority levels based on the number of stations involved, duration, and status of the Seabrook plant:

LOW – limited to one station and/or low level alerts and/or short duration alerts

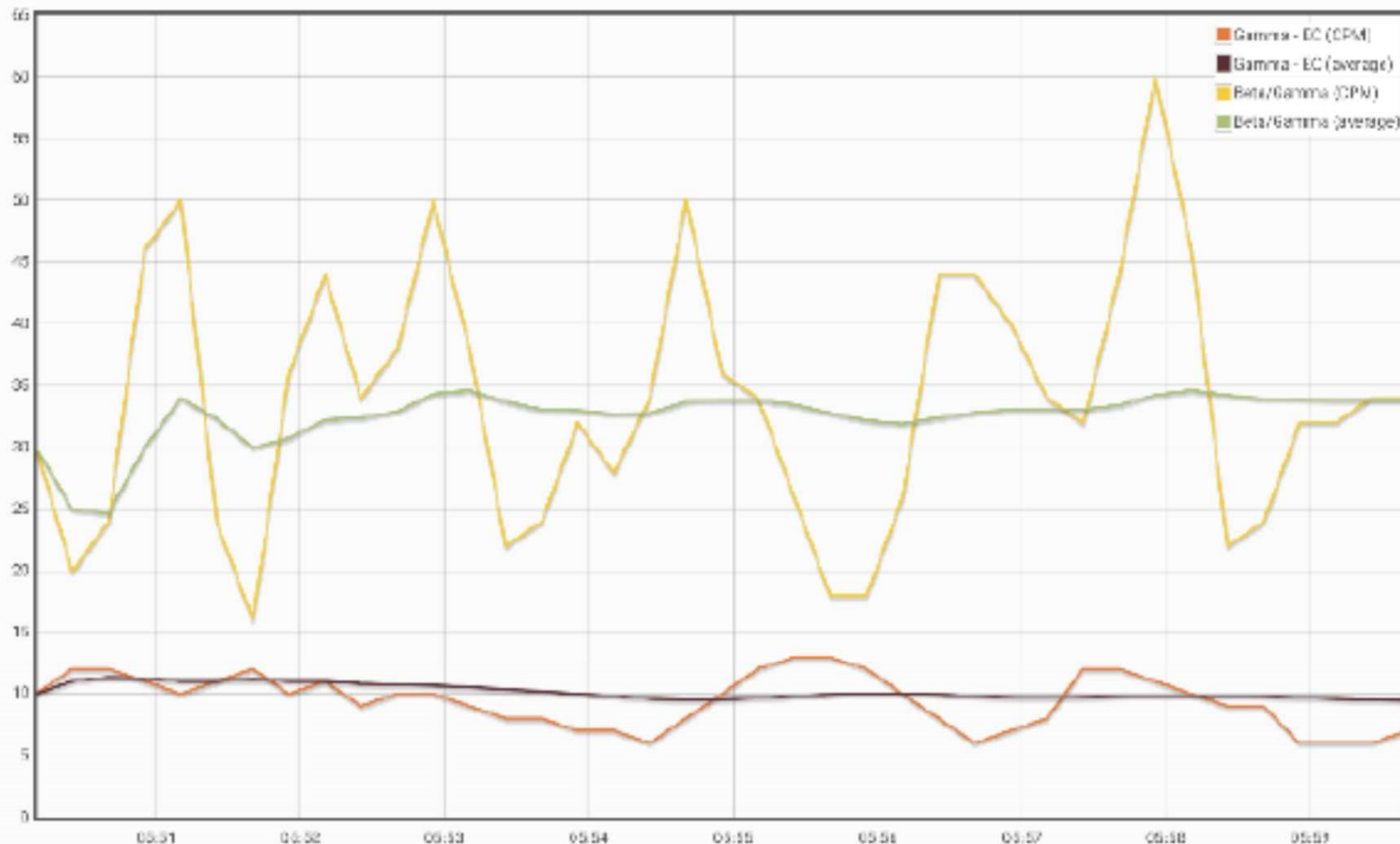
MEDIUM – multiple stations and/or duration of several hours

HIGH – multiple stations and/or duration longer than several hours

C-10 responds to an alert by:

- 1. Running a computer program to produce graphs and contour maps**
- 2. Reviewing the graphs to determine the radiological activity across area and time and emailing graphs to State personnel**
- 3. Reviewing weather conditions and wind data to determine potential point of origin**
- 4. If needed, contacting meteorologist Dr. Sam Miller or other expert advisors to review data**
- 5. Reviewing the NRC's event notification system and contacting the NRC Resident Inspector at Seabrook**

■ DISCONNECT C-10 STATION



Gamma - Energy compensated

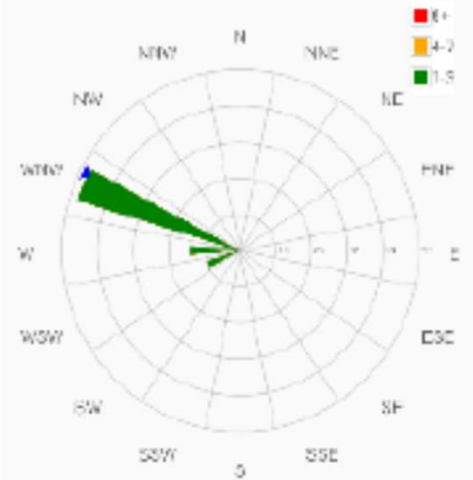
0.007 mR/hr

VALID

Beta/Gamma

34 CPM

VALID



Wind rose in Beaufort scale

Instant wind speed: 0.0 mph

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Example of the available graphical data representations showing instantaneous and average beta and gamma levels on the left and wind speed and direction info on the right.



It was a beautiful April morning, and our Network Administrator Mike Mansir loaded up the trailer, slapped the C-10 magnets on his jeep and packed enough coffee to keep him running.

C-10 YouTube Videos

3 minute, 29 second video on C-10's monitoring network:

<https://youtu.be/iktwdKk6yUI>

Installing a new monitoring station in New Hampshire:

<https://youtu.be/2xh7-s4rLE4>